

SHIMIZU et al., S.N. 09/406,570
Page 2

Dkt. 2271/57219-A

Listing of Claims

The following listing of claims will replace all prior versions, and listings, of claims in the subject application:

1. (currently amended) An optical information recording medium comprising information tracks extending in a circumferential direction and spaced from each other in a radial direction by lands, wherein:

a first information track and a second information track are radially adjacent but are radially spaced from each other by a single land;

a first phase pit encoding preformat information for a first groove in the first information track is connected to the second information track and extends radially therefrom toward, but does not reach, the first information track;

said first phase pit and said first groove have substantially equal depths;

said first phase pit is radially connected with another groove adjoining on a side of the pit away from the first groove;

a partition wall is formed in a radial direction between said first phase pit and said first groove; and

a track pitch of said first information track and a width and a length of said first phase pit are selected according to a condition that the preformat information for the first information track is reproduced from the first phase pit with a differential signal,

wherein said first phase pit encodes preformat information for said first groove, is connected to said another groove, does not encode preformat information for said another groove and is not connected to said first groove.

SHIMIZU et al., S.N. 09/406,570
Page 3

Dkt. 2271/57219-A

2. (original) The optical information recording medium as defined in claim 1,
wherein a width Δ of said partition wall in the radial direction and the track pitch TP
satisfy the relationship:

$$\Delta / TP \geq 0.1.$$

3. (original) The optical information recording medium as defined in claim 1,
wherein a width Wp of said phase pit, the length Lp of said phase pit in the
circumferential direction, the track pitch TP, and a spot diameter BD of a recording/reproducing
light beam satisfy the relationship:

$$Lp/BD < 1.0, \text{ and}$$

$$0.8 \leq WP/TP \leq 0.9.$$

4. (previously presented) The optical information recording medium as defined in claim
1,

wherein a width Wp of said phase pit, the length Lp of said phase pit in the
circumferential direction, the track pitch TP, and a spot diameter BD of a recording/reproducing
light beam satisfy the relationship:

$$1.0 \leq Lp/BD, \text{ and}$$

$$0.5 \leq WP/TP \leq 0.8.$$

5. (original) The optical information recording medium as defined in claim 1,
wherein a width Wp of said phase pit, the length Lp of said phase pit in the

SHIMIZU et al., S.N. 09/406,570
Page 4

Dkt. 2271/57219-A

circumferential direction, the track pitch TP, and a spot diameter BD of a recording/reproducing light beam satisfy the relationship:

$$1.0 \leq Lp/BD, \text{ and}$$

$$0.8 \leq WP/TP \leq 0.9.$$

Claim 6 (canceled).

7. (previously presented) The method of mastering as defined in claim 18,

wherein the values of said spot diameters BD1 and BD2 of said first and second exposing light beams are respectively fixed to constant values; and

wherein the distance L between the spots of said first and second exposing light beams is adjusted by changing the incident angle of at least one of said exposing light beams directed to an object lens by use of a light deflection element.

8. (currently amended) An optical information recording medium comprising:

circumferentially extending grooves forming information tracks and phase pits forming

circumferentially extending preformat tracks; and

a partition wall formed in a radial direction between a phase pit for a first groove and the first groove,

wherein said first groove and phase pit are substantially equally deep,

said phase pit is radially connected with another groove adjoining on a side of the phase pit away from the first groove,

said phase pit encodes preformat information for said first groove, is connected to said

SHIMIZU et al., S.N. 09/406,570
Page 5

Dkt. 2271/57219-A

another groove, does not encode preformat information for said another groove
and is not connected to said first groove, and

a track pitch of said given information track and a width and a length of said phase pits are selected according to a condition that the preformat information for the given information track is reproduced from said phase pits with a differential signal.

9. (previously presented) The optical information recording medium as defined in claim 8,

wherein a width Δ of said partition wall in the radial direction and the track pitch TP of said information track satisfy the relationship:

$$\Delta / TP \geq 0.1.$$

10. (original) The optical information recording medium as defined in claim 8,

wherein a width Wp of said phase pits, the length Lp of said phase pits in the circumferential direction, the track pitch TP of said information tracks, and a spot diameter BD of a recording/reproducing light beam satisfy the relationship:

$$Lp/BD < 1.0, \text{ and}$$

$$0.8 \leq WP/TP \leq 0.9.$$

11. (original) The optical information recording medium as defined in claim 8,

wherein a width Wp of said phase pits, the length Lp of said phase pits in the circumferential direction, the track pitch TP of said information tracks, and a spot diameter BD of a recording/reproducing light beam satisfy the relationship:

SHIMIZU et al., S.N. 09/406,570
Page 6

Dkt. 2271/57219-A

$$1.0 \leq L_p/BD, \text{ and}$$

$$0.5 \leq WP/TP \leq 0.8.$$

12. (previously presented) The optical information recording medium as defined in claim 8,

wherein a width W_p of said phase pits, the length L_p of said phase pits in the circumferential direction of said information tracks, the track pitch TP of said information tracks, and a spot diameter BD of a recording/reproducing light beam satisfy the relationship:

$$1.0 \leq L_p/BD, \text{ and}$$

$$0.8 \leq WP/TP \leq 0.9.$$

13. (currently amended) An optical information recording medium comprising:
circumferentially extending grooves forming information recording tracks, and phase pits
encoding preformat information for said tracks; and
a partition wall formed in a radial direction between a phase pit for a first groove and the
first groove,
wherein phase pits encoding preformat information for a given track are radially spaced
from that track and are connected to an adjacent track,
said first groove and phase pit are substantially equally deep,
said phase pit is radially connected with another groove adjoining on a side of the phase
pit away from the first groove,
said phase pit encodes preformat information for said first groove, is connected to said
another groove, does not encode preformat information for said another groove

SHIMIZU et al., S.N. 09/406,570
Page 7

Dkt. 2271/57219-A

and is not connected to said first groove, and

a track pitch of said given track and a width and a length of said phase pits are selected according to a condition that the preformat information for the given information track is reproduced from said phase pits with a differential signal.

14. (original) The optical information recording medium as defined in claim 13, wherein a width Δ of said partition wall in the radial direction and the track pitch TP satisfy the relationship:

$$\Delta / TP \geq 0.1.$$

15. (original) The optical information recording medium as defined in claim 13, wherein a width Wp of said phase pits, the length Lp of said phase pits in the circumferential direction, the track pitch TP, and a spot diameter BD of a recording/reproducing light beam satisfy the relationship:

$$Lp/BD < 1.0, \text{ and}$$

$$0.8 \leq WP/TP \leq 0.9.$$

16. (original) The optical information recording medium as defined in claim 13, wherein a width Wp of said phase pits, the length Lp of said phase pits in the circumferential direction, the track pitch TP, and a spot diameter BD of a recording/reproducing light beam satisfy the relationship:

$$1.0 \leq Lp/BD, \text{ and}$$

$$0.5 \leq WP/TP \leq 0.8.$$

SHIMIZU et al., S.N. 09/406,570
Page 8

Dkt. 2271/57219-A

17. (original) The optical information recording medium as defined in claim 13,
wherein a width W_p of said phase pits, the length L_p of said phase pits in the
circumferential direction, the track pitch TP , and a spot diameter BD of a recording/reproducing
light beam satisfy the relationship:

$$1.0 \leq L_p/BD, \text{ and}$$
$$0.8 \leq W_p/TP \leq 0.9.$$

18. (currently amended) A method of mastering an optical information recording
medium comprising information tracks extending in a circumferential direction and spaced from
each other in a radial direction by lands, comprising:

exposing a master to a first exposing light beam for forming a first information track and
a second information track that are radially adjacent but are radially spaced from
each other by a single land;

exposing said master to a second exposing light beam for forming a first phase pit
encoding preformat information for a first groove in the first information track,
wherein said first phase pit is connected to the second information track and extending
radially therefrom toward, but not reaching, the first information track, said phase
pit is radially connected with another groove adjoining on a side of the phase pit
away from the first groove, a partition wall is formed in a radial direction between
said first phase pit and said first groove, and said first phase pit and said first
groove have substantially equal depths;

wherein said first phase pit encodes preformat information for said first groove, is

SHTMIZU et al., S.N. 09/406,570
Page 9

Dkt. 2271/57219-A

connected to said another groove, does not encode preformat information for said another groove and is not connected to said first groove;

wherein, when a spot diameter of said first exposing light beam is BD1, a spot diameter of said second exposing light beam is BD2, a distance between said first and second exposing light beams is L, and the width of said partition wall in the radial direction is Δ , the values of BD1, BD2, L, and Δ satisfy the relationship:

$$\Delta = L - [(BD1/2) + (BD2/2)]; \text{ and}$$

wherein a track pitch of said first information track and a width and a length of said first phase pit are selected according to a condition that the preformat information for the first information track is reproduced from the first phase pit with a differential signal.

Claim 19 (canceled).